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FINAL ENVIRONMENTAL IMPACT STATEMENT

ADMINISTRATIVE ACTION - Proposed Westmoreland Resources' Sarpy Creek Mine - Big Horn County

Submitted Pursuant to the Montana Environmental Policy Act
Section 69-6504 (b) (3), R.C.M. 1947

Prepared by

STAFF SERVICES DIVISION
MONTANA DEPARTMENT OF
STATE LANDS

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I. INTRODUCTION

Low sulphur strippable coal constitutes a natural resource which is being highly publicized as an immediate answer to the national "energy crisis". Montana has a large amount of this sought after, low sulphur, strippable coal within the Ft. Union formation under her eastern plains.

As the potential for vast development of the strippable coal reserves in Montana has increased, citizen concern for the potential environmental impact of the mining operations has also increased. Reclamation laws were passed in the Montana State Legislature in 1967, 1969, and 1971. In 1973, a reclamation law hailed as the strongest in the country was enacted by the State Legislature to help prevent and minimize degradation by coal strip mining such as that witnessed in Appalachia and the eastern coal states.

Chapter 325, SLM, 1973, the Montana Strip Mining and Reclamation Act, in part provides that: contour mining is prohibited; unique areas are subject to selective denial of mining; a permanent, diverse vegetative cover must be established; the area of land affected must be returned to the approximate original contour; the method of operation is controlled by the Department; and others. Each of these involves extensive analysis and an ultimate decision on the issuance of a permit by the Department.

The Montana Environmental Policy Act (Sections 69-6501 thru 69-6517, RCM, 1947) and the guidelines adopted by the Montana Environmental Quality Council require State agencies to prepare an environmental impact statement when acting upon permit requests for operations which may have a significant effect on the environment, which may precipitate the first decision in a series of decisions that may have a cumulative effect on the environment, or which may be controversial. The Department of State Lands has determined that acting on Westmoreland Resources permit application satisfies all three of these requirements.

Evaluation of the possible direct environmental impacts of this mining operation is not intended to be extrapolated to other mines or other areas of intended mines. It is to concern only the Sarpy Creek operation and its related facilities.

II. DESCRIPTION OF THE PROPOSED ACTION

Background

In April, 1971, preliminary inquiries were made to the Department of State Lands by Westmoreland Resources concerning applicable reclamation laws for a proposed strip mining operation. It was not until September 12, 1972, however, that an official application for contract under the Open Cut or Strip Mined Land Reclamation Act (Sections 50-1018 thru 50-1033, RCM 1947) was submitted to the Department of State Lands. Due to administrative procedures and inadequacies in the application material Westmoreland Resources had not received a contract at the time of passage of Chapter 325 and repeal of the 1971 law. On May 21, 1973, Westmoreland Resources then submitted an application for permit under Chapter 325.

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Location of the Proposed Operation

The proposed Westmoreland Resources' Sarpy Creek Mine will be located in Big Horn County, Township 1N, Range 37E. Mining operations for the first five years will be in Sections 23, 25, and 26. (See Appendix.) This area is in the upper Sarpy Creek drainage approximately 30 miles east of Hardin, Montana, and about thirty-one miles south of the confluence of Sarpy Creek and the Yellowstone River. Colstrip, Montana, the scene of extensive coal strip mining operations since 1923, is located about twenty-five miles east, on the far side of the Little Wolf Mountains.

The proposed mine site is on Tract III of an area known as the Ceded Strip. The Ceded Strip comprises an area, not on the reservation, in which the Crow Indians hold the coal rights and private landowners hold the surface and other mineral rights.

The Proposed Operation

Westmoreland Resources proposes total disturbance of 1,280 acres over the 20 year period for which their current sales contracts run. Two hundred acres will be disturbed by the roads, sediment pond, rail loop, and other mine facilities while the additional 1,080 acres will be stripped. This acreage will fulfill four coal sales contracts for delivery of 77,000,000 tons, anticipating 4 million tons and 50 acres per year, to Northern States Power Company, Interstate Power Company, Dairyland Power Cooperative, and Wisconsin Power and Light.

Westmoreland Resources also has an additional 248 million tons of reserves in Tract III uncommitted. If additional sales contracts are made, the presently anticipated mine area could be expanded and the 20 year mine life could be extended for an unspecified number of years. According to E. P. Leisenring, president of Westmoreland Coal Company: "It is difficult to predict exactly how all this coal will ultimately be used. My best guess is that about 13 million tons per year will be shipped by rail to the various markets described earlier. The balance will most likely be converted to synthetic gas by Colorado Interstate Gas or by some other gas pipeline company."[1]

In an agreement dated December 1, 1971, Westmoreland granted an option to Colorado Interstate Gas Company to acquire up to 300 million tons of coal. That option may be exercised at any time prior to November 30, 1981. Colorado Interstate had indicated to Westmoreland Resources that no immediate plans for a coal gasification facility at Sarpy Creek are being made but the possibility is not ruled out for the future.[2]

In order for a gasification facility to be fueled from the Sarpy Creek Mine the current plant and facilities would have to be expanded. With the existing mining equipment and facilities Westmoreland Resources could handle shipments of up to 6½ million tons of coal per year by adding another work shift and more unit trains. However, the existing plant can also be modified to handle up to 13 million tons per year. In order to do that Westmoreland Resources would have to spend approximately $20 million: $12-15 million for a new dragline and mobile equipment to handle the additional mining and reclamation and $1-5 million to expand the storage facility and plant. This would require a functional lead time of at least four years, taking into account current laws, availability of ordered equipment, and so forth.

At the present time, Westmoreland Resources does not hold the surface rights over all of Sections 24 or 25, the preferred direction of mining. With the present holdings, the operation can continue as planned for five years at which time Westmoreland must either acquire the disputed surface or utilize alternate plans which include moving on to State School Section 36.

The company has applied for a total of 330 acres to be disturbed in the first twelve months of the operation or the duration of the first annual permit. This includes the coal stripping area, 55 acres; the area for placement of the box cut spoils, 75 acres; basic haulage roads, 35 acres; access road, 15 acres; rail loop, maintenance, service, and storage buildings, 95 acres; topsoil storage areas, 10 acres; settlement pond, 10 acres; truck dump, ammonium nitrate storage, diesel fuel storage, secondary crusher building, reject coal storage area, marketable coal storage area, powder magazine, and connecting roads, 35 acres. Westmoreland will bond 825 acres, however, in order to provide for unforeseeable contingencies.

Some of the acreage for the first year has already been disturbed, including that for the rail loop, plant site, dragline construction site, and some roads. Part of this disturbance was effected prior to the passage of the 1973 law. The remainder was allowed by the Department pursuant to an opinion of Attorney General Robert Woodahl (Volume No. 35, Opinion No. 20, August 8, 1973) which stated that the above activities do not constitute strip mining under the law and thus do not require a permit before commencement.

Westmoreland has calculated that it will cost an average of $2,200 per acre to reclaim the land at the proposed mine site. This includes backfilling, grading, retopsoiling, highwall reduction and seeding. (See breakdown in Appendix, pp. 32 and 33).

The present mining plan calls for mining of the Rosebud-McKay seam, the Robinson seam, and 2 stray seams (Figure 1). The mining and reclamation plan as submitted by Westmoreland Resources in their application for permit is included as an appendix, and will serve to describe the proposed operation in detail.

If the mine is permitted and operations begin, it is estimated that 100 persons will be employed with a payroll of $1.5 million: 56 persons in crafts (union); 34 as clerical, supervisory, and administrative; and an additional 10 people to cover such factors as turnover, absenteeism, vacations and holidays, and other such contingencies. A high percentage of these personnel are expected to be Crow Indians. The present construction work force consists of 68% Crow Indians with one Indian administrator.

III. ENVIRONMENTAL IMPACT OF PROPOSED ACTION

Westmoreland Resources has estimated that the average cost of reclaiming the land at Sarpy Creek will be $2,200 per acre. Assuming that the Rosebud-McKay seam has a thickness of 30 feet, the Robinson, 20 feet, and two 4-foot stray seams, the total average depth of mineable coal is 58 feet.

WESTMORELAND RESOURCES

Test hole comparison

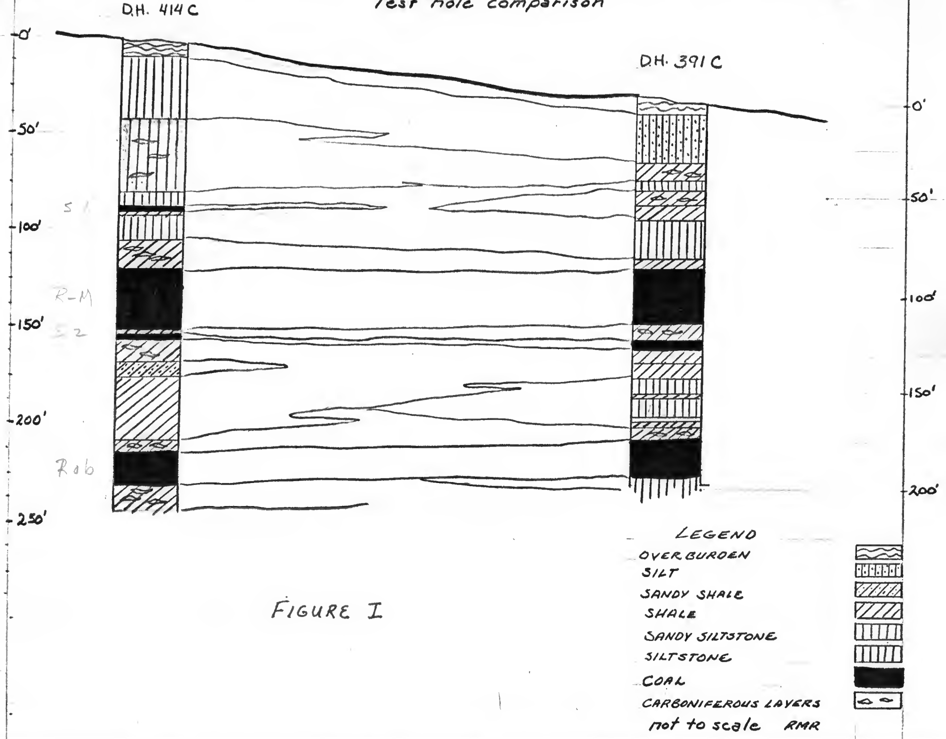

FIGURE I

not to scale RMR

The cost of reclamation to the company should have an insignificant effect on the price of energy to the consumer and not be prohibitive to mining. Using a figure of 1760 tons of coal per acre foot and assuming 90% recovery (1584 tons/acre foot), approximately 91,872 tons of coal per acre will be mined. Using a rail head price of $2.50 per ton, a conservative figure, the total worth of one acre equals $229,680. The cost of reclamation thus would be 2.4¢ per ton, a comparatively minor cost.

Without proper reclamation added costs would be passed on to society because of the productive land taken out of use permanently.

Mining of this coal should have a beneficial effect on the economy of the Crow Indian Tribe since they own the coal rights and will not have the costs of providing additional services. The income generated from the Westmoreland Resources payment of royalties to the Crows and the job preference given to them at the mine site should raise the standard of living of the tribal members.

The Crow Tribal Council has consistently supported development of its coal resources in Sarpy Creek. This support has included the tribe filing as an intervenor in Civil Action #1182-73 filed June 13, 1973, in U. S. District Court for Washington, D. C. (Sierra Club, et al. vs. Morton) along with Westmoreland Resources, Peabody Coal Company, Montana Power Company, and others.

Since the mineral rights and the surface rights are separate, the effect of mining on the surface lands is not of primary concern to the Crow Tribe. These lands are or have been owned by private landowners who have utilized them for agricultural and grazing purposes. There will be an impact of the strip mine on the life style of the Sarpy Basin and its people including increased population, more urbanization, traffic and others. That full impact will not be known until the cumulative effects of allowing one strip mine in that area are known.

The tax income to Montana generated by the Westmoreland mine would be approximately $2 million of which about 35% would go to Big Horn County in the form of net proceeds tax and property tax and the remaining 65% to the State, mostly through the severence tax. This figure does not include the Burlington Northern rail taxes, payroll taxes or royalty rates.

Westmoreland will provide mine-site health and accident facilities for its employees including a first aid room, an ambulance in a heated building, communication with medical facilities, and all supervisors with Bureau of Mines first aid training.

Chapter 325 establishes a broad set of limits beyond which the environmental impacts of strip mining are to be considered unacceptable. These limits have become known as the "selective denial" provisions of the reclamation act and are contained in Section 9(2) of the law:

> Section 9(2) The department shall not approve the application for prospecting or strip mining permit where the area of land described in the application includes land having special, exceptional, critical, or unique characteristics, or that mining or prospecting on that area would adversely affect the use, enjoyment, or fundamental character of

neighboring land having special, exceptional, critical, or unique characteristics. For the purposes of this act, land is defined as having such characteristics if it possesses special, exceptional, critical or unique:

(a) biological productivity, the loss of which would jeopardize certain species of wildlife or domestic stock; or

(b) ecological fragility, in the sense that the land, once adversely affected, could not return to its former ecological role in the reasonable foreseeable future; or

(c) ecological importance, in the sense that the particular land has such a strong influence on the total ecosystem of which it is a part that even temporary effects felt by it could precipitate a system-wide reaction of unpredictable scope or dimensions; or

(d) scenic, historic, archaeologic, topographic, geologic, ethnologic, scientific, cultural, or recreational significance. In applying this subsection, particular attention should be paid to the inadequate preservation previously accorded Plains Indian history and culture.

The selective denial provisions of the law do not specify the precise boundaries of the environmental limits which are to be observed nor do they provide a scale by which to measure the value or quality of land for the characteristics which the legislature has declared shall be preserved or maintained.

Since the determination must be made by the Department of State Lands, however, whether the Sarpy Creek Basin constitutes an area where a permit should be denied, the Department has attempted to evaluate the data available within the bounds of possible interpretations of the law.

1. Biological Productivity

Although no legal interpretation has been made of the term "jeopardize" as used in the act a preliminary interpretation of the concept is that to "jeopardize" a species of wildlife or livestock there must be a significant loss or potential loss of wildlife or livestock numbers. This concept is directly related to any unique productivity of the site compared to other areas as well as man's ability to provide a balanced habitat for livestock or wildlife. The significant loss of habitat for any rare and endangered species would also jeopardize a wildlife species.

A. Permit Area

The permit area taken as an individual site does not appear to constitute an area which if disturbed by mining activities would jeopardize certain species of wildlife or domestic stock. The estimated grazing productivity of the open grazing range on the proposed mining area is between 3.0 and 3.5 acres per animal unit month. This is equivalent to grazing land of between 15 and 18 animal units per year per section of grazing land. Forty-seven percent of the 4,186,536 acres of state grazing land administered by the Department of State

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[illegible] economic opportunities, and that it will [illegible] result in creation of effective cooperative structures [illegible]

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Lands is in a 15 to 19 AU per section grazing classification. The state trust lands represent an extensive stratified statistical sample of the grazing lands in the state. Within Big Horn County 59% of the 83,793.4 acres of state grazing land is in the 15-19 AU classification. However, in Treasure County only 9% of the 38,643.78 acres of state grazing land are in the 15-19 AU classification. This increased relative value of 15 AU grazing land in Treasure County could partially be accounted for by a relatively small area of Treasure County within the Soil Conservation Service average annual precipitation zone of 14-20 inches. The mining area is within this average zone which exists predominately to the east (Rosebud County) and south (Big Horn County) of the mining area.

The ridge where the mining operation is located would also be expected to have lower grazing productivity than the bottomlands on Sarpy Creek and its east fork.

The temporary loss of grazing range in the proposed permit area probably will not cause any ranching operation in the area to suffer because of loss of size efficiency or loss of a critical use area. Any future expanded mining operations in Sarpy Creek may, however, cause a significant reduction in the resident livestock numbers due to significant temporary loss of grazing acreage or extensive loss of highly productive lands such as grain fields, hay meadows and overflow range sites which are important to a viable ranching operation. Loss of a human resource could occur if too much land is withdrawn from grazing use from any one ranching operation thus forcing the ranch operator to dispose of his remaining lands and leave the business or purchase an operational unit somewhere else. A ranch is not simply an area of land; it is a balanced combination of grazing lands, winter feed production areas, domestic stock, and experienced people to maximize and maintain the balance. It is also a food production source for other members of society.

There is no reported or observed existence of extensive critical wildlife habitat in the area which would jeopardize significant numbers of wildlife. All sites in the permit area which experience complete vegetation removal will be removed from wildlife forage use. The intensity of equipment operation and human activities in the area will eliminate small, relatively non-mobile animals and may reduce wildlife entry into the area.

B. Neighboring Land

Land use on much neighboring land is agricultural. If the mining operation has significant impacts on the productivity of this land then livestock which depend upon these areas either summer or winter could be jeopardized. Although a complete inventory has not been made, there are non-irrigated hay fields along Sarpy Creek and near the east fork which some ranchers and State Land Department personnel feel are experiencing increased production due to water tables in the root zone of deep rooted crops on the alluvium bottoms. Little historical data is available on productivity nor has the existence and importance of the sub-irrigation been fully evaluated.

The proposed mining operation for the permit year will not directly disturb land used for agricultural purposes. Figure 2 shows the location of major cropland use in the vicinity of the proposed Westmoreland mining operation. The NW¼ of Section 25 (in the direction of mining) contains a field which was last used

for agricultural purposes in 1936 but has returned to grass under natural conditions. Production data is not available on this field. A field to the east of the proposed mine site in Section 25 is presently used for small grain production. Although Figure 2 shows the field possibly planned for future mining, Westmoreland Resources has not obtained the surface rights to mine this area. The organization Friends of the Earth has obtained production data on this field from the owner, John Redding:[3]

1967 - grassland broken (plowed)
1968 - 47.5 bu/ac winter wheat (without irrigation or fertilization)
1969 - 35 bu/ac Barley (without irrigation or fertilization)
1970 - Summer fallow
1971 - 40 bu/ac wheat (without irrigation or fertilization)
1972 - Summer fallow (cheat grass invades)
1973 - 20 bu/ac wheat (without irrigation or fertilization)

The average per acre yield for the two adjacent counties is as follows:[4]

Average Yield in Bushels per Acre
(fertilized or non-fertilized not separated)

		1968	1969	1970	1971	1972
Big Horn:	W. Wheat	34.0	27.2	25.9	30.0	34.6
	Barley	41.0	34.5	21.7	40.0	33.6
Treasure:	W. Wheat	35.7	29.2	23.4	32.0	28.7
	Barley	46.5	37.8	27.3	54.0	35.2

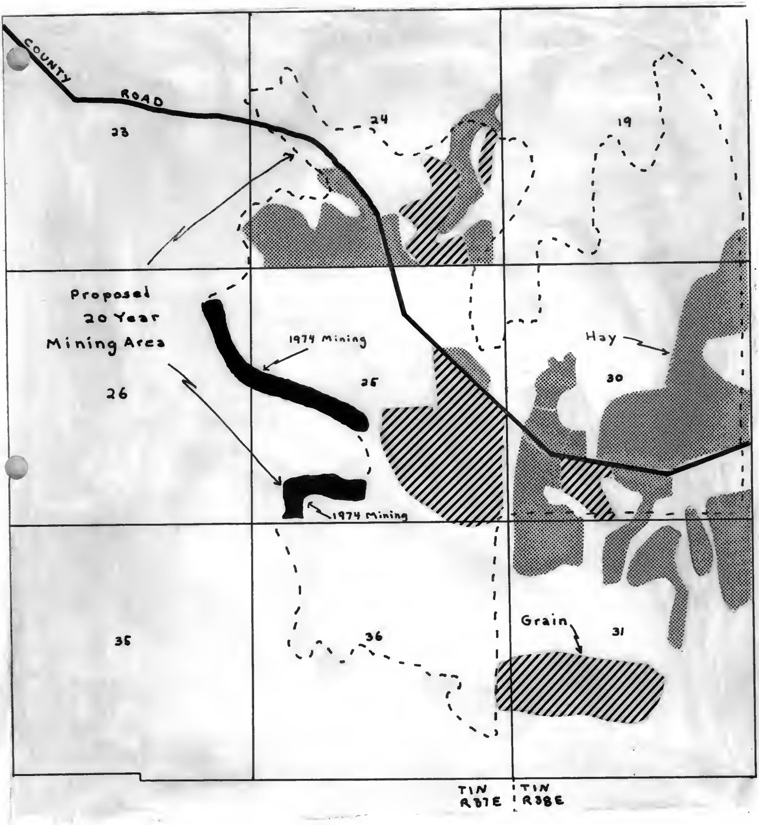
Comparison of the average production data for the counties with the reported production of the Redding field shows that the field has experienced above average production in 1968 and 1971 and average or below average production in 1969 and 1972.

Future mining activities, if permitted, will disturb hay fields, grain fields, and seeded pasture. The production data on the field in Section 25 indicates that agriculture is a productive activity in the area but not necessarily uniquely productive in terms of the region. The fields are, however, productive areas important to local ranch units since varying topography and soils limit the areas which can be farmed.

Reclamation efforts on the proposed mining area in Section 25 will indicate whether or not such land can be returned to productive use since the soils in the northern part of the field in Section 25 are the same series as some of the soils which would be disturbed during the permit year. No lands used specifically for crop production would be disturbed during that time.

All of the coal seams proposed for mining on the Westmoreland property are aquifers and may contribute to alluvium discharge as well as to springs and wells in the area. The permit application data submitted by Westmoreland indicates that the uppermost coal bed (Rosebud-McKay) is of little importance to the water systems in the area. The lower coal bed (Robinson) would have little influence on sub-irrigation productivity in Sarpy Creek because most of the agricultural use is on the east side of Sarpy Creek; the Robinson bed outcrops above the drainage on the west side.

MAJOR CROPLAND IN VICINITY OF PROPOSED WESTMORELAND MINE



Compiled from Westmoreland air photos and information
supplied by John Redding, December 5, 1973. No field checking.
Does not include seeded pasture land which may be used for hay.

Figure 2

The situation in the East Sarpy Creek drainage is more complex. Agricultural use does not occur in the East Sarpy Creek bottom but does occur adjacent to the channel of a side drainage about two and one-half miles east of the proposed mine area. Ground water flow data submitted by Westmoreland indicates that the Robinson aquifer does flow in the direction of these agricultural fields. It cannot be shown, however, that mining will cause productivity loss on these fields. The permit area occurs on an up-dip of the Robinson bed and does not appear to represent a significant recharge area.

2. Ecological Fragility

The proposed mining operation will remove an extensive area of pure ponderosa pine thickets and stands. The Bureau of Indian Affairs has determined the age of small-diameter pine in the permit area at about 60 years. A larger 18" diameter tree was estimated to be over 200 years. It is evident from this information that the removal and reintroduction of forest areas will be a long term process. Removal of some dense dog hair thickets and replanting of pine trees will help increase the timber productivity of the sites but the ecological role of the timber stands as parkland, edge effect producing areas, and small mammal production areas will probably not be recreated until many years after mining operations have been completed. Only long term excessive research can determine whether planting success can be achieved on reclaimed areas.

The forest area and its relation to criteria specified by the legislature is not clear. The timber is to be cleared to enable strip mining to occur. Yet the timber could be harvested by a landowner for the purpose of lumber production not related to mining. Denial of a permit for the timbered areas would not necessarily prevent timber removal.

Westmoreland Resources has indicated that all merchantable timber (standing or fallen) will be salvaged and sold. Initial cutting has occurred in the construction area; further felling will precede the mining operation. All unmerchantable timber will be burned.

Within the permit area at the upper end of the drainage running southeast to northwest through the SE¼ of Section 25, Township 1N, Range 37E, there is a narrow canyon. The soil in the bottom of this canyon is the productive Fort Collins Loam. Vegetation on the moderate sloping south side of this canyon (north facing slope) is predominately dog hair thicket, ponderosa pine forest. A portion of the canyon bottom near the eastern boundary of the application area is completely filled with snowberry.

The north side of this canyon (south facing slope) is a clinker rock cliff approximately 60 feet high with an estimated average slope of 40% angling toward an open ponderosa pine forest on a relatively flat ridge to the north. A minor interesting feature just above this topographic break in the mining area is a mushroom ring colony (fairy ring) estimated to be 100 feet in diameter and extremely old. Skunkbush sumac, large ponderosa pine specimens and a few Rocky Mountain juniper grow from between the fairly massive clinker rock formations. The rock area should be an excellent water infiltration area and open wildlife browse area. Wildlife data submitted by Westmoreland Resources indicates pheasant use of this drainage. Sharp-tailed grouse, deer, and turkeys probably also utilize the area.

This cliff, which is an interesting topographic feature, was proposed for use as a spoils area for the reserve pit planned to the south. After critical review, the Department of State Lands determined that this area was ecologically fragile and that the natural drainage system would be irreparably damaged. Westmoreland Resources has thus already been served notice that, if a permit should be granted, the cliff area will be deleted from the permit area. The company therefore must revise and resubmit their mining plans to exclude the cliff area from disturbance.

3. Ecological Importance

There is no known ecological function of the mining area (as indicated by permit application data) which, if disturbed using lawful mining techniques and reclaimed according to law, would precipitate a system-wide reaction of unpredictable scope or dimensions.

4. Scenic, Historic, Archaeologic, Topographic, Geologic, Ethnologic, Scientific, Cultural or Recreational Significance

Scenic Significance

It is commonly agreed that scenic qualities are often dependent upon individual human psychology and are expressed as feelings rather than logic or rationale. Scenic qualities, however they are measured, are independent of the concept of scenic attraction in which the area receives a high visitation rate due to development of recreational facilities or high quality access facilities. Scenic qualities cannot be measured by visitation rates.

The Sarpy Creek Basin encompasses scattered agriculture, rolling hills and open grass-forest land. Ranching and farming operations blend in with the rolling, sometimes abrupt, topography. This setting will be temporarily disrupted by the proposed mining operation. Regrading, recontouring, and revegetation of the permit area may return the overall visual effect.

Historic and Archaeologic Qualities

There is no evidence that significant historic and archaeologic qualities exist in the area.

Topographic and Geologic Significance

Land having topographic and geologic significance should be either a known classic example of a landform or geologic structure or it should be a unique landform or geologic object. From the application data submitted and field inspection it does not appear such qualities exist on the proposed mine area. A few sandstone balancing rock formations do exist on land planned for future mining but these will not be disturbed by the mining operation during the first permit period.

Scientific and Cultural Significance

The BIA impact statement indicates that the area does not have outstanding significance to Indian culture. The area does, however, have a local cultural significance to ranchers in the area whose families have been caring for and living on the land in Sarpy Basin for several generations.

There is no known significant scientific value of the application area or neighboring land.

Recreational Significance

Part of the reason the Sarpy Basin has maintained its beauty is its relative isolation and lack of a variety of recreational attractions which draw large numbers of people with resultant recreational developments and improved access. Hunting does occur but there is no evidence that there is greater pressure than in other areas of the state.

It is possible that the proposed Westmoreland Resources mine, if permitted, could become a tourist attraction. Experience at the Anaconda Company's Berkeley Pit in Butte and at several other existing coal strip mines indicates that this may occur.

In any case, improved access and facilities will be required for the mine site itself. The Highway Department is, in fact, already making plans for improvement of an existing road in the area which includes surfacing and concomitant improvements of an 11+ mile stretch of Montana Secondary Highway No. 384 from Hardin to Sarpy Creek.

IV. ALTERNATIVES TO THE PROPOSED ACTION

Not Granting Permit

The effect of denying the permit would be no mining at the present time at this location. This would allow the land and physical systems in Sarpy Creek to continue to exist undisturbed and the people living there to maintain their current way of life. The Crow Tribe would lose the royalty payments from this particular coal, the jobs generated by the mine, and the accompanying rise in their standard of living. However, the Crow Tribe has the option of possible coal exchanges and the development of the large reserves on the reservation itself, where the surface, the minerals, and the coal are all owned by the Crow Tribe.

Denial of the permit would force the energy companies having coal sales contracts with Westmoreland Resources to find new sources of low sulphur coal to fuel their midwestern generating plants and would eliminate this specific area as a potential mine mouth gasification plant site. It would also require Westmoreland Resources to dismantle the rail line and loop, the dragline, and the accompanying mine facilities and buildings which are already built or in the process of being built at the site and to reclaim the land already disturbed.

Underground Mining

The major advantage to underground mining is that there would be little disruption of surface strata. At Sarpy Creek, underground mining of the relatively shallow Rosebud-McKay and Robinson seams probably would create subsidence or underground caving.

Underground mining under present conditions is more hazardous than surface mining due to roof falls, coal falls, explosion, and dust inhalation. It also is less productive. Surface mining achieves a productivity of 200 tons per man shift whereas a maximum productivity for underground mining would be 20 tons per man shift.

Equipment for underground mining has been developed for coal seams less than 10 feet in thickness and the problems of mining seams 20 to 30 feet thick would require the development of a new family of equipment. Development of an underground mine often requires the expenditure of up to six times more capital than the development of a surface mine.

Deep mining must also leave a substantial area of pillars to provide roof support. Under today's conditions it is a rare occurrence to achieve a recovery rate greater than 60% in underground mining whereas surface mining recovers as much as 90% of the available coal. Finally there is a distinct shortage of underground mining personnel in Montana. The development of such a mine would require the importation of substantial numbers of qualified people or training of existing unemployed Montanans.

However, in the Sarpy area it is reported that there are at least 10 coalbeds that are persistent and attain a mineable thickness.[5] The existence and persistence of these beds and the possibilities for deep mining some of them should be explored in more depth.

Also, according to Administrator Russell E. Train of the Environmental Protection Agency (EPA) the United States can only become the Saudi Arabia of coal by digging deep in the ground for it rather than concentrating on strip mining. Said Train: "With such a small percentage of our total coal supply strippable the underground reserves are by all odds the predominant sources that we have. We're going to have to get at this in any event.

The sooner we can make underground (mining) more economically attractive, more technologically feasible and more socially acceptable as a way of life, (and) way of employment, 'the better off we're going to be,' he said during (an) interview."[6]

The Environmental Policy Center (EPC) recently released a report based on figures put out by President Nixon's Council on Environmental Quality (CEQ). The CEQ report said that of the reserve of 1.55 trillion tons of coal in the United States, 45 billion tons could be obtained through strip mining - about 3 per cent. The figures released by EPC on Montana are shown in the following table.[7]

	Total Reserves	Deep Mine Reserves	Strip Mine Reserves	Ratio Deep Mine to Strip Mine Reserves
Ratio of deep mine coal to strippable coal (units in millions of tons)				
Subbituminous---------	132,116.6	128,716.6	3,400	38:1
Bituminous------------	2,104.6	2,104.6	0	0
Lignite---------------	87,481.7	83,984.7	3,497	24:1

	Total Reserves	Deep Mine, Low Sulphur Reserves	Strip Mine, Low Sulphur Reserves	Ratio, Deep Low Sulphur to Strip, Low Sulphur
Ratio of deep mine, low sulphur coal to strippable, low sulphur coal (units in millions of tons, sulphur content 1% or less)				
Subbituminous---------	132,116.6	127,636.0	3,176	40:1
Bituminous------------	2,104.6	269.4	0	0
Lignite---------------	87,481.7	81,399.0	2,957	27:1

The Montana Bureau of Mines and Geology has recently updated its figures on the existing strippable coal reserves in Montana to 40+ billion tons. The total reserves and the deep mine reserves figures have not been updated, however, so it is not possible to interpolate that figure.

Contour Mining, Auger Mining

Chapter 325 prohibits contour mining.

Auger mining produces a relatively low rate of recovery of the coal in place. At this point in time equipment does not exist to auger mine seams 22 to 30 feet in thickness. Auger mining is too wasteful to perform on a virgin acreage of coal; but it is useful to recover coal in an area where the coal has been deep-mined previously to the limit permitted by roof conditions.

In Situ Mining

"In situ" mining used to recover sulphur and potash dissolved in super heated water distributed through a shaft would have the advantage of limited surface disturbance but for coal there appears to be little technology today to determine whether the coal seams are sufficiently friable to be pumped from underground by hydraulic methods in a slurry form. Rates of recovery and product contamination are impossible to predict.

Alteration of Mining and/or Reclamation Plan

Under Chapter 325, the mining and reclamation plan must comply with all aspects of the law before a permit can be granted. Substantial alteration of the proposed mining and reclamation plan while still allowing surface mining at Sarpy Creek would therefore not change the overall impact of the operation appreciably. An alteration of the mining plan has been required by the Department in order to protect an ecologically fragile narrow canyon.

If Westmoreland Resources does not acquire the surface rights to the remainder of Sections 24 and 25, the mining plan will have to be altered to expand the mine in another direction. The result would be no surface disturbance on Section 24, less disturbance on Section 25 but potentially equal disturbance on another section or sections.

Utilization of Other Forms of Energy

This would involve utilization of oil, oil shale, tar sands, and other fossil fuels which are in short supply and also involve substantial land disturbance.

V. RELATIONSHIP BETWEEN SHORT TERM USE OF MAN'S ENVIRONMENT VS. LONG TERM PRODUCTIVITY

The most obvious conflict is between the traditional use of the land for agricultural and grazing purposes and the proposed short term use for surface mining.

There is some degree of uncertainity as to whether agricultural land disturbed by mining in the Sarpy Creek Basin can be returned to its former use in the near future. This uncertainty has been expressed in a U.S. Geological Survey report with the following comment: "as to whether the areas currently under cultivation can be returned successfully to this use cannot be predicted. Thus the presently cultivated lands will probably be reclaimed to the lesser value grazing lands."[8] Discussion with the author of this report indicates that the emphasis of this comment was directed toward the immediate use of land for agriculture upon reclamation. (Personal communication, A.F. Czarnowsky, 12/12/73.)

The surface-mined coal will be utilized for electrical generation purposes in midwestern cities, providing heat, lights, and so forth. It also will help the power companies to meet SO_x air pollution standards. However, since Western coal is lower in BTU content than Eastern coal, more tonnage must be burned to provide the same amount of heat, thus probably resulting in more ash and a higher percentage of other elements released into the air.

One relationship that very little is known about is the effect of surface mining upon subsequent underground mining. The thesis has been proposed that surface mining may jeopardize future underground operations but little or no evidence has been advanced to support this.

Current use of the strippable, low sulphur coal eliminates the possibility for its use at a latter date for other possibly more useful purposes, such as petrochemicals. These may be more important to the country in the long run.

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The coal being mined is an irretrievable commitment of a nonrenewable resource. Once that coal is mined and burned it is lost forever for all other uses.

If Westmoreland Resources is not granted a permit to mine in Sarpy Creek, the energy, materials, and labor that have gone into the construction of the facilities already present will be lost. If Westmoreland is granted a permit, the electricity, materials, and fuel reserves needed to operate the mine will be irreversibly committed.

VII. LITERATURE CITED

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[4]Montana Department of Agriculture and USDA Statistical Reporting Service.
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B.C. Research. 1973. Environmental analysis - Sarpy Creek coal development. February.

USDI. 1973. Draft environmental impact statement - Crow Ceded Area coal lease. BIA. October 1.

Big Horn County. 1973. Appraisal office. Unpublished.

IX. PUBLIC COMMENT ON THE PROPOSED COAL STRIP MINE AT SARPY CREEK

The Montana Department of State Lands solicited and received substantial public comment in response to a draft environmental impact statement circulated on October 19, 1973, and a public hearing held in Crow Agency, Montana, on November 6, 1973.

Westmoreland Resources is the first operator to propose a completely new coal strip mine under the 1973 reclamation act. As such, it has received considerable attention from citizens, not only of Montana, but throughout the country.

The Department has received a total of 55 letters commenting on the proposed mine. Twenty of these addressed themselves directly to the draft environmental impact statement; the remainder were generally stating a position one way or the other.

This large volume of correspondence, with some of the letters totaling up to 100 pages in length, precludes including copies of each letter with every impact statement. The original copies of all letters are on file for public review at the Department's office in Helena as is the transcript of the public hearing which was held in Crow Agency.

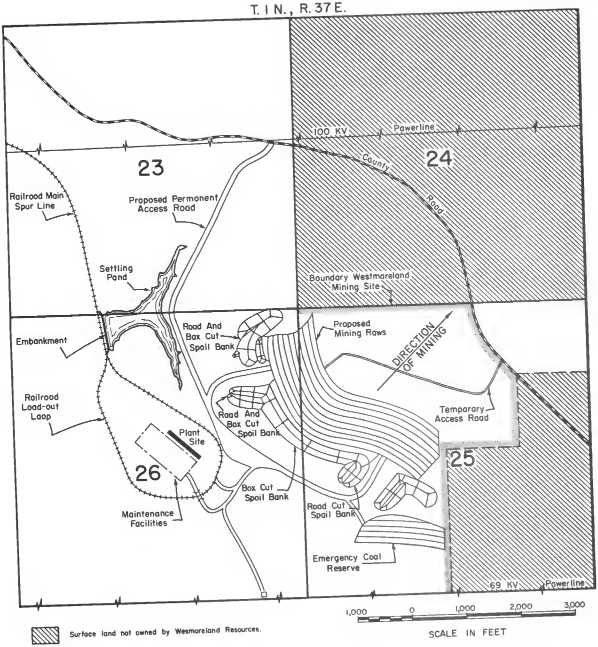
Of the 35 letters addressed directly to the Department as general comments on the Sarpy Creek Mine, 34 were in opposition to granting a permit and one was expressing interest only.

On file with the Department of State Lands are photocopies of correspondence received by the Bureau of Indian Affairs relating to their draft environmental impact statement on the Crow Ceded area coal lease. Numerous letters in favor of the operation are included in this correspondence.

APPENDIX

This appendix was taken directly from the amended Westmoreland Resources application for permit. The exhibits mentioned are not included with this statement but are on file in the Department of State Lands.

MINING SITE AND FACILITIES



▨ Surface land not owned by Westmoreland Resources.

MK

THE WESTMORELAND PROPOSAL

Since the project will be controlled and operated by Westmoreland Resources, the description of the methods and equipment to be used in the ~~mine and presented in the following pages is taken, with minor editing, directly from their Environmental Report. (2) It is presented to enable the reader to utilize the information contained in this document and to better understand the proposal and its possible impact. Map 3 shows the plan view of the mine site.~~

[illegible]

~~Map 3 indicates initial mining to the northeast until Westmoreland abuts the boundaries of its present surface ownership which indicates mining for five to six years. Alternatives for fulfillment of the 20 year coal sales contracts (77,000,000 tons) are available to Westmoreland and at this date no one alternative is clearly preferable. Therefore after five years, Westmoreland will be required to file a mining plan covering the mining of the balance of the coal to be delivered under the 20-year contract committals. Similarly if additional contracts are made to sell more than the 77,000,000 tons, a revised plan will be needed.~~

~~The Mining Plan~~

~~The mining plan contemplates stripping 55 acres in the first year, during which an additional 75 acres will be disturbed by spoil bank~~ (not yet mined) ~~placement of overburden from the box cut. In the ensuing 19 years, an additional 50 acres will be mined annually making a total of 1,080 acres over the 20-year project life. During the life of the mining operation, covered by the application for approval, the total to be~~

Mining Plan

The basic mining plan over the long term is laid out to produce coal from four separate seams. A 3-foot seam, known as Stray #1, overlies the Rosebud-McKay seam. During the first year of operation, this seam will be totally oxidized and have no marketable value. It will be mined by the dragline and mixed into the spoil from the burden overlying the Rosebud-McKay seam. The Rosebud-McKay seam is approximately 30 feet in thickness and is the principal seam to be mined during the first year. Underlying the Rosebud-McKay seam is another 3-foot seam, Stray #2, separated from the Rosebud-McKay by a parting of approximately 5 feet in thickness. Another 60 feet below Stray #2 is the 20-foot Robinson seam of coal. One full year in development work mining the Rosebud-McKay and Stray #2 seams will be required to provide room to spoil innerburden between the Rosebud-McKay and Robinson seams. After the first year, the basic mining plan is to mine all four seams of coal.

During the initial year of mining operation, three cuts will be made to the Rosebud-McKay and Stray #1. The excavation to the Robinson seam and the mining thereof will take place during the second year and the years following.

Development activities are now in progress at the mine site to construct a railroad loop, a coal truck dump hopper and primary crushing station, a secondary crushing station, a train loadout station, a coal storage facility to store a maximum of 50,000 tons of coal, and maintenance, service and administrative facilities. Morrison-Knudsen Company, Inc., contractor to Westmoreland Resources, is erecting a dragline on the site. These construction activities were approved by the Department of State Lands, by letter dated September 22, 1972, a copy of which is attached as Exhibit 21.

Mining activities are expected to begin on January 1, 1974, with the first coal to be loaded into unit trains on April 1, 1974.

The mining operation will proceed according to the following sequence: (1) Topsoil removal (2) overburden blasting (3) overburden removal (4) coal removal (5) coal processing and shipping (6) recontouring (7) topsoil replacement (8) revegetation.

Topsoil, to an average depth of one foot, will be removed by rubber-tired scrapers or by bulldozer, exercising care to prevent mixing of topsoil with less desirable layers below. A map, attached as Exhibit 9, details specific depths of topsoil to be removed and stockpiled from specific areas.

Stockpiles of topsoil will be located in areas where the material will not have to be rehandled until it is placed back on the recontoured spoil areas. These stockpiles will be constructed in such a manner as to prevent, or reduce to a minimum, loss from erosion of the sides and will be located in areas not affected by runoff from melting snows or heavy rainfall. The areas designated for temporary stockpiling are indicated on Exhibit 1.

In preparation for blasting, a Bucyrus-Erie 45-R Drill will be used to provide 11-inch holes for blasting with ammonium nitrate. This machine will operate one shift per day, 5 days per week. The amount of the charge will depend on the hardness of the material to be loosened.

Overburden removal will be accomplished by a Marion 8200 dragline equipped with a 325-foot boom and a 75-cubic yard bucket. Opening of the mining area will require the development of a box cut along the burn line of the Rosebud-McKay seam. The spoil from this cut will be cast in the direction away from the area to be mined and will be placed on the original ground surface. The sequence of mining is shown on Exhibit 1.

After the first cut has been completed and the coal removed, a second cut will be taken parallel to the first cut and the spoil from this cut will be banked against the spoil from the first cut as well as in the open area left by the removal of coal from the first cut to the Rosebud-McKay seam. When coal has been removed from the second cut, a third cut on the Rosebud-McKay seam will be taken parallel to the first two cuts. This spoil will be deposited in the open area left by the removal of coal from the second cut. At this point in the operation, since the spoil material from cut #3 has been fully placed in a mined out cut of the Rosebud-McKay seam, it will be possible to re-handle spoil to place it further from the next cut to be made, thus creating an area to place material overlying the Robinson seam. A series of cross-sections, A-A', B-B' and C-C', located by reference to Exhibit 1, have been prepared to show specifically the placement of overburden in typical areas of the mining operation. These cross-sections demonstrate the progress of the operation at the end of Year 1, and at the end of Year 2. These cross-sections are attached hereto as Exhibit 22. Sub-surface soil tests do not show the presence in the overburden to be removed in the 1st year of materials which would be prohibitive to establishment and growth and revegetation techniques; however, if such material should occur, that material will not be left on the top or within 8 feet of the top of regraded spoils or at the surface of any other affected area.

Sequence No. 2 in the mining operation will take place in the S½SW¼ of Section 25. This area is to be developed as an emergency area to provide for problems which may arise in the main mining area due to breakdown of the dragline, unforeseen conditions, Acts of God etc. This previously exposed coal would be removed to the extent necessary until the difficulties in the main pit could be corrected. As soon as practical, a like amount of coal would then be uncovered in this emergency area to replace coal previously removed.

During the first year of operation, the dragline would operate on a normal schedule of two shifts per day, five days per week.

Westmoreland Resources plans to construct an internal power line and to move the dragline thru the buffer zone at the southeast end of the first pit area. Since no precipitous slopes will be developed, since no runoff of water will develop and no erosion will take place, since the property line is totally fenced off and since the area is fully bonded, there can be no harm, danger or damage done to the adjoining property owner. The alternative is to reduce the length of each cut and thus deprive the Crow Tribe of Indians of additional royalty. The requirement not to mine buffer zones has already mandated a royalty loss to the Crow Tribe. The inability to use the buffer zone for any mining activity, even though it has no adverse affect on adjoining property, would increase this loss further.

Coal will be prepared for loading by cleaning miscellaneous material from the top of the seams. The coal will then be blasted to permit loading by two 18-cubic-yard front-end loaders. Coal will be transported by 120-ton trucks to the truck dump station.

As the coal loading proceeds on the Rosebud-McKay seam, the parting between the Rosebud-McKay and the Stray #2 seam will be removed by front-end loaders, rippers and dozers or truck and shovel operation. This material will be deposited at the base of the spoil bank on the low wall side of the cut, where it will be covered by spoil from the next cut on the Rosebud-McKay. When this overburden has been removed, coal from the Stray #2 seam will be loaded by 18-yard front-end loaders and transported to the truck dump.

Under normal conditions, the coal loading operation will take place on a single shift, five days per week.

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The location of two basic haul roads are shown on Exhibit 1. In order to provide suitable and safe haulage roads, it will be necessary to excavate through burn material to reach the elevation of the base of the Rosebud seam. Since these roads will be excavated through rock material, the cut slope will not be in excess of 1½ to 1. The surface of the haul road will be burnt (scoria) material. This material will be developed during the excavation of the basic haul roads and will be stockpiled for future transport by scrapers or trucks for surfacing haul roads. The location of the scoria storage is indicated on Exhibit 1.

The haul roads will be constructed on a 0% grade to the active pit. Statistics have shown that the major number of accidents in open pit mining occurs in the haulage phase. With that in mind, and with the desire to reclaim road slopes simultaneously with mining, the roads will be constructed on a 0% grade and the side slopes in this area will be recontoured during the mining process to a slope of 20°. Contouring the roads in the process of uncovering coal will make these slopes available for revegetation almost simultaneously with the stripping. Several additional road construction patterns have been studied with enormous thoroughness. Each alternative system, because of the necessity to cross the scoria area, would delay reclamation of roadside slopes for periods of three or more years.

Roads will be sprinkled with water, as needed, to allay the dust. A well has been drilled to the Mission Canyon formation of the Madison group to provide sufficient water for road sprinkling and other uses.

Coal handling facilities do not contemplate washing or extensive preparation. Processing will involve only crushing run-of-mine coal to a 2" x 0 product.

Recontouring of the areas covered by spoil materials will be accomplished as soon as excavation in the pit has advanced sufficiently to permit regrading without interfering with future spoil placement. The time schedule for the recontouring operation is indicated on the cross-sections in Exhibit 22. It should be noted that the area indicated by Section A-A' can be recontoured almost immediately by pushing the spoil outward from each cut to level an extensive coulee. A drainage culvert will be installed, extending east/west, in order to prevent accumulation of water on the eastern side of the area to be recontoured. International Engineering Company, San Francisco, is currently conducting the studies necessary to determine the size and configuration of this drainage system. This particular recontouring will avoid a substantial delay, will provide an area for prompt topsoil replacement and will improve the overall slope characteristics.

The side slopes of the haulage roads will also be immediately available for revegetation, since they will be recontoured in the mining process. In areas depicted by Section B-B' and Section C-C' of Exhibit 22, Westmoreland Resources intends to recontour by moving the spoil inward toward the area to be mined. Since this material will be moved a substantial distance toward the active cut and placed in the area where material from future mining of the Robinson seam will be placed, the recontouring of this area will, of necessity, be delayed until the end of the first year of operation. Thereafter, when mining has reached the Robinson seam of coal, it will be possible to recontour closely following the excavation of each new cut.

As the coal haul roads enter the mining area a gentle transition will be made from the 34^{o} backslopes of the rock excavation area to the 20^{o} backslopes of the haulage ways to the pit.

Equipment used in the recontouring operation will generally be bulldozers. It may be necessary in some instances to move material beyond the economic distance of bulldozers, in which case, scrapers or a truck and shovel operation will be used to complete the recontouring.

The recontouring work will be performed on a single shift, five days per week, as areas become available in the normal sequence of mining. Cross-section D-D', Exhibit 22, represents a profile of the contour to be achieved by the total recontouring procedure.

As soon as spoil areas have been recontoured, topsoil will be replaced on the regraded spoil. Wherever possible, material will be removed from the stockpiles by use of rubber-tired scrapers, hauled directly to the placement site and deposited on the recontoured area to an average depth of 8 inches. Where considered necessary, this topsoil may be compacted to prevent erosion and to provide a proper seed bed.

Topsoil will be placed on the 1½ to 1 slopes of access and railroad cuts and embankments, by depositing either at the top or the bottom of the slope and then working either up or down the slopes with a bulldozer blade. These topsoil materials will then be compacted on the slopes by passage of the crawler treads of the tractor to prevent erosion and to make a proper seedbed. The embankment to the southwest of the maintenance area and approximately 75% of the cut-fill slopes of the railroad loop have been topsoiled in this manner and the results have been successful.

Location of access roads, both existing temporary construction roads and the permanent access roads, are shown on Exhibit 1.

A basic drainage plan for the mine and the mining area has been prepared and is displayed on Exhibits 1 and 2. The constructed drainage

system, consisting of interceptor ditches and piping under roads and embankments, has been constructed and will be maintained to minimize collection of surface water in the mining area and the mining pit. This internal system has been designed to accommodate runoff from a 10-year storm. Water which may result from direct rainfall or sub-surface seepage in the pit will be pumped out promptly to prevent the possibility of deleterious effects caused by water coming into contact with coal seams. Water now emanating from the lower seam in small quantities is alkaline; therefore, Westmoreland Resources does not anticipate an acid water situation. On the other hand, if such a situation should develop, this water will be treated chemically to prevent any harmful effects.

All internal drainage will be channeled into a settlement pond and overflow system to be constructed east of the large railroad fill, immediately north of the loop track, as shown on Exhibits 1 and 2. Drainage from this pond will proceed to Sarpy Creek via a coulee which is dry most of the year.

This detention dam will minimize high sediment concentrations in runoff emanating from the mining property, particularly from the interior drainage system and the spoil banks. The spillway elevation of 3415 feet provides a potential detention storage volume of 77 acre feet.

The 6-foot diameter glory hole spillway has been designed to accommodate a 50-year storm; however, compacted fill on the upstream section of the railroad embankment will be topped out at an elevation of 3435 feet. The impervious blanket creating the upstream face of the dam will be placed to an elevation of 3420 feet, a sufficient height to accommodate a 100-year storm, considering the acceptable head which could be developed at the spillway.

Clean water will be decanted from the sediment pond by use of a 12 inch

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square gate located 10 feet above the floor of the pond. Westmoreland Resources has applied for and been granted a Permit for Waste Discharge by the Montana State Board of Health and Environmental Sciences - a copy of which is attached as Exhibit 33. Water monitoring procedures required by the permit will be performed.

Monthly water-quality monitoring will be performed and reported in accordance with Regulations - Water Quality (1) (b) (vi).

International Engineering Company, San Francisco, engineered the design and consulted on the construction of the dam. The basic plans for the dam are attached hereto as Exhibit 24.

International Engineering Company has determined that the only approval required for the construction of the dam is that a Registered Professional Engineer certify that the dam has been designed and constructed in a safe manner. It should be noted that Mr. George R. Murphy, Registered Professional Engineer, Montana (3001E) has affixed his seal to each of these drawings.

During the construction phase of this project, it has been necessary to remove both oxidized coal and marketable coal from areas of the railroad loop and where the existence of oxidized coal within the interior of the loop would provide an improper foundation material for substantial buildings. The oxidized coal was loaded out with scrapers and buried at a location shown on Exhibit 1. The marketable coal also was loaded out with scrapers and then placed in a stockpile for future sale to customers of Westmoreland Resources. The location of this stockpile is shown on Exhibit 1.

Rules and Regulations of the Department of State Lands require the establishments of buffer zones at property lines and at various other locations. The buffer zones are shown on Exhibit 1. It should be noted that no buffer zones are shown along property lines separating Section 25

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from Section 36 and separating Section 26 from Section 23. In both cases, Westmoreland Resources has the right to mine the mineral and to affect the surface on either side of the property line, even though the ownership of mineral and/or surface may be separate.

Reclamation

Reclamation procedures involve recontouring of overburden piles, restoration of topsoil and reseeding. In Westmoreland Resources' situation, reclamation procedures will involve - first, the reclamation of the areas disturbed during construction and second, the areas to be disturbed during the mining procedure.

In the construction phase, all recoverable topsoil was removed for later replacement. The embankment southwest of the maintenance area (Exhibit 1) has been topsoiled and reseeded and the cut-fill slopes of the railroad loop have been topsoiled over 75% of their extent. Growth has been achieved in the maintenance area, even though planting was accomplished late in the season.

In all probability, if the construction proceeds on schedule, there will be additional areas of completed construction available for reseeding in the spring of 1974. Grading on the railroad loop is now complete and the topsoiling procedure should be accomplished by October 15, 1973. Westmoreland Resources plans to reseed these areas just as soon as they are topsoiled. In any event, reseeding of construction areas should be substantially complete by the end of the spring planting season in 1974. In the reseeding process, done on an experimental basis in the spring of 1973, Crested Wheat Grass was sown and, in spite of the dry summer, has shown significant growth. Westmoreland Resources is currently consulting with the Soil Conservation Service to determine a satisfactory seed mixture to be planted in the early spring of 1974.

In order to erect the dragline, topsoil was removed in the fall of 1972. This topsoil was stockpiled and reseeded with a mixture of grasses and now shows significant cover.

During the mining operation, topsoil will be removed and stockpiled from affected areas: - areas to be mined and areas to be affected by placement of box cut spoils or future recontouring. If the stockpile is to remain inactive for more than 6 months, it will be reseeded to prevent erosion by either water or wind.

The second phase in the reclamation procedure will be recontouring of spoil bank areas. The time schedule, method and equipment to be used has been discussed in the Mining Plan.

As shown in the series of Cross-Sections A-A' through C-C' of Exhibit 22, the overburden to be placed in the spoil bank during the first year of operations will be a mixture of all of the strata overlying the Rosebud-McKay seam. It should be noted that refuse material from coal cleaning and the parting between the Rosebud-McKay and the Stray #2 seam will be deposited at the base of the spoil bank and covered by the next cut. Soils analysis and greenhouse testing have demonstrated that the strata overlying the Rosebud-McKay seam will produce significant growth.

After recontouring has taken place, however, and before redistribution of topsoil, a further series of soil samples will be taken to determine the growth potentiality of the immediate sub-soil. These soil samples will determine whether or not further action should be taken to provide more productive material. If, after natural mixing, the surface soil is toxic to vegetation, remedial action will be taken.

In order to retain moisture and to prevent erosion, all recontoured spoil areas will be terraced along the contour by use of a notched blade on a bulldozer or by similar techniques. This type equipment should create small terraces at an approximate interval of 8 to 10 feet. After the recontouring process and redistribution of topsoil, all areas will be seeded

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in the next immediate planting season. Numerous agricultural consultants have advised Westmoreland Resources that planting should be conducted no sooner than October 15th in the fall and no later than May 15th in the spring. These recommendations will be followed.

Areas that can be worked with machinery will be drill seeded as suggested by the Soil Conservation Service, at 1/2 to 3/4 inch depth. Areas that cannot be traversed with equipment will be broadcast seeded and dragged by a spiked tooth harrow or similar equipment. Broadcast seeding will be done at double the rate designated for drill seeding. Terracing, seeding, harrowing and other operations will be done as nearly as practicable on the contour to assist in controlling erosion.

The Department of State Lands has suggested the following seeding plan.

Seeding Plan

Species:	Pounds PLS/A Seeded X 2 For Broadcast
1. Western Wheat Grass (Agrophron smithii)	5 lbs.
2. Green Needle Grass (Stipa Viridula)	5 lbs.
3. Slender Wheat Grass (Agropyron trachycaulum)	5 lbs.
4. Four Wing Saltbush (Atriplex Canescens)	5 lbs.
5. Skunkbrush Sumac (Rhus Tricobata)	2 lbs

Sweetclover or alfalfa are also adaptable and may be included.

It must be understood that many other seed mixtures may be more suitable to this project. Westmoreland Resources plans to consult with and obtain recommendations from the Soil Conservation Service in order to develop future seeding plans which will restore the surface to its original use as rapidly and effectively as possible. First year vegetation results will serve as study areas for modification to the seeding plans.

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Westmoreland Resources also plans to continue a program of soil testing and analysis in order to develop the most effective revegetation program.

For roadsides and other critical areas where erosion may be a severe hazard, the area will be mulched as necessary. A timber contractor is now working the area removing marketable timber in advance of stripping. This operation may provide a stockpile of sawdust which could be used effectively as mulch material. Other species such as Streambank Wheat Grass, Thickspike Wheat Grass or Crested Wheat Grass may be superior and may be seeded according to Soil Conservation Service seeding specifications.

Experimental efforts will be made to plant woody species for wildlife and aesthetic values particularly along haul road slopes. Species selected may include Skunkbush, Sumac, Ponderosa pine, Cottonwood, Wild Rose, Chokecherry and Willow.

The area of immediate mining operations, encompassing some 815 acres, has been fenced off in order to separate construction and mining activities from cattle grazing on adjacent property. In future years, additional fencing will be done as required to protect revegetated land from immediate grazing pressure and, conversely, to provide a test plot to demonstrate that the area can withstand normal pasture use.

On conclusion of mining, the sediment pond will be left in place as a permanent stockwater pond and possible an irrigation dam for future ranching activities.

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The final step in the mining and reclamation procedure will be the removal of all permanent facilities, drainage structures, roads and the railroad loop which are being constructed at the present time in order to operate the mine. As the mining draws to a close there will be an area of Robinson seam coal underlying the railroad loop, the original haul roads and the undisturbed areas where the Robinson is overlain by Rosebud clinker. The average mining ratio of this entire area will be sufficiently low to permit the final mining of the great majority of this mineral and there should be a sufficient quantity of mineral remaining to make it worthwhile to complete total mining.

It is not possible to predict at this point in time how the coal will be marketed; however, the area will be mineable. In the process, all permanent facilities will be removed from the property. The final disposition of permanent facilities will, of course, involve the sale of as much of the equipment as possible and the burial of the main concrete structures. This, therefore, should be considered as a part of the final mining procedure. After final recontouring, natural drainage will be re-established along former haulage roads.

The rules and regulation promulgated under Chapter 325 Session Laws of Montana 1973 require that each operator estimate the cost of reclamation. Westmoreland Resources has made a prediction as to what the final cost of reclamation will be based on the various parameters of this application. It must be understood on the other hand that no mining company in Montana has had any real experience in reclaiming land in accordance with present laws and regulations; thus there are still many intangibles which have not bern resolved to this date. Next, Westmoreland Resources has not operated

in the State of Montana and is opening a new property, so that estimates cannot be based upon actual performance. It is not possible, at the present time, to make any prediction as to future changes in the law, future regulations, future increases in cost due to inflation or other unknown occurrences. Not withstanding, Westmoreland Resources estimates the cost of reclamation to be $2,200 per acre detailed as follows:

1.	Highwall Reduction and Backfilling	$50.00
2.	Spoil and Ramp Road Grading	$1,425.00
3.	Grading of Associated Disturbance Areas	$3.00
4.	Topsoil Removal and Replacement	$515.00
5.	Site Preparation Activities	$15.00
6.	Revegetation	$192.00
		$2,200.00 per acre